



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,855	09/19/2003	Hiroshi Wada	9319S-000552	5774

27572 7590 07/26/2006

HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER

MOON, SEOKYUN

ART UNIT PAPER NUMBER

2629

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/666,855

Applicant(s)

WADA ET AL.

Examiner

Seokyun Moon

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 May 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 09/19&10/25&01/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

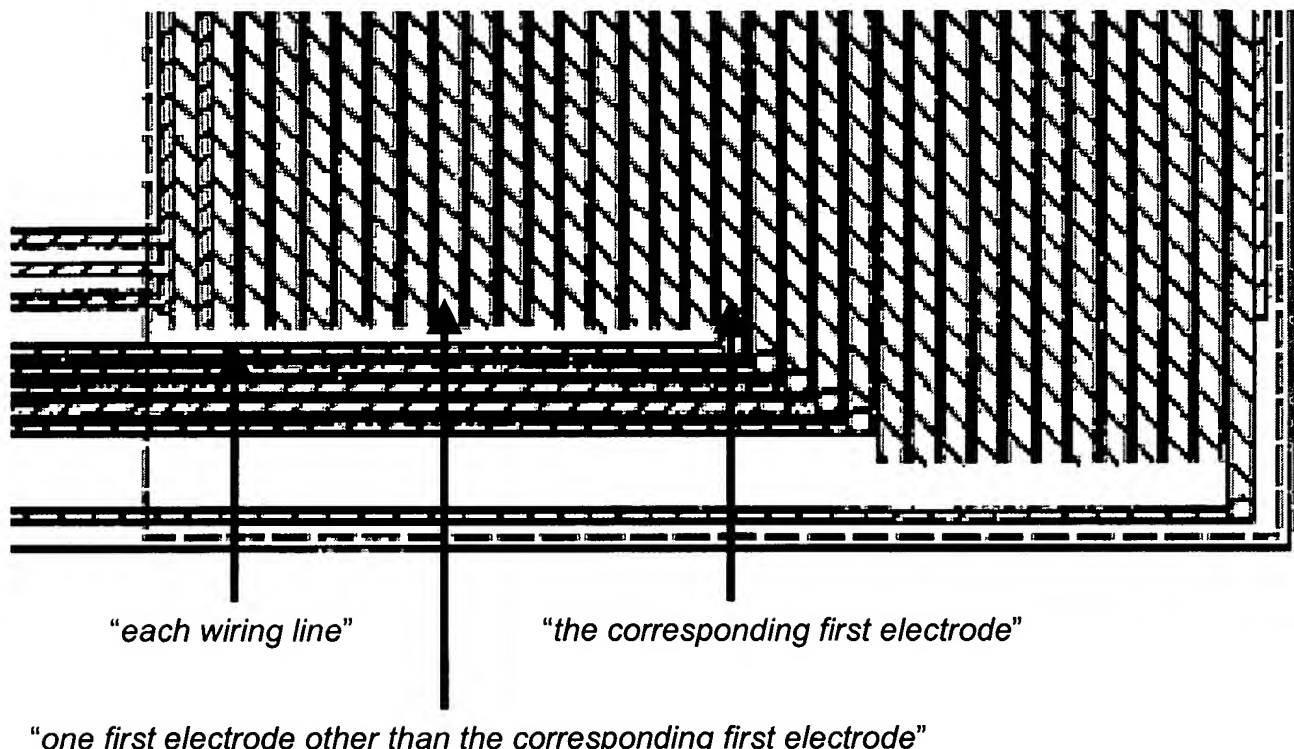
2. **Claims 1, 3, 6, 7, 9, and 11** are rejected under 35 U.S.C. 102(b) as being anticipated by Higuchi et al. (US pat. no. 6,323,930 B1, herein after referred to as "Higuchi").

As to **claims 1 and 3**, Higuchi [fig. 1] teaches a liquid crystal device having liquid crystals between a first substrate ("*glass substrate 2*") and a second substrate ("*glass substrate 1*") that faces the first substrate through a sealing material ("*sealing material 3*") [col. 5 lines 34-37], in which pixels corresponding to intersections of a plurality of first electrodes ("*common electrodes 12*") on the first substrate and a plurality of second electrodes ("*segment electrodes 11*") on the second substrate [fig. 3] [col. 6 lines 15-19] are turned on or off in accordance with voltages applied to the first electrodes and the second electrodes, the liquid crystal device comprising:

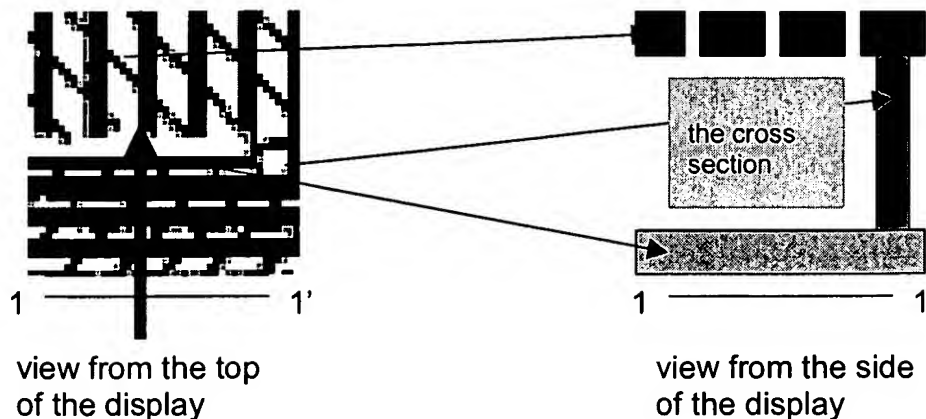
wiring lines ("*output wires 21b*"), provided on the second substrate ("*glass substrate 1*") [fig. 6], each wiring line corresponding to one of the first electrodes ("*common electrode 12*") on the first substrate, the wiring lines being connected to the corresponding first electrodes [fig. 5] [col. 6 lines 41-46] and each having a part

Art Unit: 2629

extending in an area surrounded by inside edges of the sealing material (*"sealing material 3"*) [figs. 1 and 5], each wiring line intersecting at least one first electrode other than the corresponding first electrode, the wiring lines forming cross sections [drawing 2 provided on page 4 of this office action] with the at least one first electrodes other than the corresponding first electrodes [drawing 1 provided below]; and



Drawing 1

Drawing 2

Higuchi inherently teaches a drive circuit applying a voltage to the first electrodes through the wiring lines [col. 6 lines 41-46] such that the effective value of a voltage applied to the liquid crystals at the cross sections becomes smaller than the effective value of a voltage applied to the corresponding pixel for turning on / off the pixel since the effective value of a voltage applied to the pixel for turning on / off the pixel is the voltage controlling the alignment of the liquid crystals constituting the display operation of the liquid crystal display and the alignment state/mode of liquid crystals is determined depending on whether the effective value of the voltage applied to the pixel is greater or less than a certain threshold voltage. When the effective value of the voltage applied to the liquid crystals at cross sections is greater than the effective value of the voltage applied to the pixel for turning on / off the pixel, the actual effective value of the voltage applied to the pixel is effected and compensated by the effective value of the voltage applied to the liquid crystals at cross sections and thus overall effective value of the voltage applied to pixel is changed, which causes an unexpected display operation in terms of gradation control for the display device.

As to **claim 6**, Higuchi [fig. 23] teaches an electronic equipment provided with the liquid crystal device.

As to **claim 7**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

As to **claim 9**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 11**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 2 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi.

As to **claim 2**, all of the claim limitations have already been discussed with respect to the rejection of claim 3 except for determining at least one of a duty ratio and a bias ratio.

Higuchi does not expressly disclose at least one of a duty ratio and a bias ratio to be determined so that the effective value of the voltage applied to the liquid crystals at

the cross sections becomes smaller than the effective value of a voltage applied to the corresponding pixel for turning off the pixel.

However, it is known that both of a duty ratio and a bias ratio are the factors causing changes on both of the effective value of the voltage applied to the liquid crystals at the cross sections and the effective value of the voltage applied to the pixel since the duty ratio is proportional to the length of the selection period for common electrodes and the bias ratio is proportional to the absolute value of a peak value of a scanning signal applied to the common electrode.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for Higuchi to set at least one of a duty ratio and a bias ratio such that the effective value of the voltage applied to the liquid crystals at the cross sections becomes smaller than the effective value of a voltage applied to the corresponding pixel for turning off the pixel, in order to prevent image degradation.

As to **claim 8**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

5. **Claims 4 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi in view of Kawakami et al. ("*Matrix Addressing Technology of Twisted Nematic Liquid Crystal Display*", Hitachi Research Laboratory, Hitachi, Ltd., herein after referred to as "Kawakami").

As to **claim 4**, Higuchi does not teach the effective value of the voltage applied to the liquid crystals at the cross sections is smaller than an intermediate value between the effective value of the voltage applied to the corresponding pixel for turning on the

pixel and the effective value of a voltage applied to the corresponding pixel for turning off the pixel.

However, Kawakami discloses that the RMS value of the threshold voltage for TNLC cells is an intermediate voltage value between the RMS voltage across selected pixels and the RMS voltage across non-selected pixels [*pg. 51 fig. 5 and pg. 52 the paragraph written under fig. 6*].

Since the threshold voltage is the minimum voltage to turn on a pixel, the effective value of the voltage applied to the pixel must be greater than the threshold voltage to turn on the pixel. However, if the effective value of the voltage applied to the liquid crystals at the cross sections is greater than the threshold voltage, the effective value of the voltage applied to the pixel is compensated with the effective value of the voltage applied to the liquid crystals at the cross sections and thus reduced to a value less than the threshold voltage causing the pixel to be off even though the pixel is supposed to be on.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to teach Higuchi to set the effective value of the voltage applied to the liquid crystals at the cross sections is smaller than an intermediate value between the effective value of the voltage applied to the corresponding pixel for turning on the pixel and the effective value of a voltage applied to the corresponding pixel for turning off the pixel to provide a wide compatible range for the effective value of the voltage applied to the liquid crystals at cross sections, thus to reduce the limitations of variables



such as applicable voltage and current range for the electronic circuits implemented in a display device.

As to **claim 10**, all of the claim limitations have already been discussed with respect to the rejection of claim 4.

6. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi in view of Morimoto et al. (US pat. no. 6,181,406 B1, herein after referred to as "Morimoto").

Higuchi does not teach a light-shielding layer provided on one of the first substrate and the second substrate.

However, Morimoto [*fig. 4*] teaches a light-shielding layer ("*light-shielding layer 63 and 64*") provided on one of the first substrate ("*opposite substrate 22*") and the second substrate ("*array substrate 20*") so as to overlay the cross sections between one of the wiring lines and first electrodes other than the first electrode connected to the corresponding wiring line among the plurality of first electrodes [*col. 8 lines 43-49*].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a light-shielding layer in a liquid crystal display device as taught by Morimoto, in Higuchi to shield light and thus to optimize the display output contrast of the display device by blocking any interfering light.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1, 7, and 11 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yomogihara et al. (US pat. no. 5,737,053) teaches a liquid crystal display device in which the area of a peripheral portion of the glass substrate can be reduced and which can be packaged easily.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 19, 2006  
S.M.

AMR A. AWAD  
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read 'Amr A. Awad', is written over a horizontal line.